Influenzal Meningitis

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OUR attention recently has been attracted by the occurrence in Purdysburn Fever Hospital of several cases of meningitis in which the causal organism was the *hæmophilus influenzæ*. A study of all admissions to Purdysburn Fever Hospital since its opening in November, 1906, shows that the first case diagnosed as influenzal meningitis was admitted in October, 1929. Another case followed in February, 1930, and then none occurred until August, 1936. A fourth case was diagnosed in November, 1936, and the occurrence of three cases during October, 1937, seems to justify a report upon these cases—seven in all.

CASE 1.

A. H., a female, aged 10 months, a town-dweller, was admitted on 8th October, 1929, on the eighth day of illness. Onset had been gradual, with fretfulness and vomiting. There was no previous history of illness. On admission: fretful and irritable; faint erythema of trunk and limbs, slight *tache cérébrale;* slight rigidity of neck, with Kernig's sign doubtful; no obvious paralysis; heart, lungs, and abdomen—nothing abnormal detected. Temperature 99.4, pulse 136. A lumbar puncture gave 40 c.c. of turbid fluid containing polymorphonuclears +, and h. influenzæ direct and on culture. Twenty c.c. meningococcal serum was given intrathecally on the appearance of the cerebro-spinal fluid. Next day lumbar puncture 50 c.c. similar fluid, polymorphonuclears + +, h. influenzæ + +, and on culture. Fluid was again replaced by 20 c.c. meningococcal serum. Lumbar puncture was repeated on tenth and eleventh days with similar findings.

Course: Remittent temperature up to 103, pulse up to 200; semi-conscious and irritable; drinking well, no vomiting; squint developed; rigidity and retraction marked. Death at seventeenth day of illness.

CASE 2.

M. McL., a female aged 6 months, a town-dweller, was admitted on 15th February, 1930, on the sixth day of illness. Onset was gradual, with fretfulness, stiffness, and irritability, but no vomiting. No previous illness.

On admission: Bad colour, no rash, well nourished; well-marked rigidity and head retraction, no obvious paralysis. Tongue furred; clean, quiet fauces; very purulent nose; heart, lungs, abdomen, and ears—nothing abnormal detected. Temperature 100.4, pulse 138. Lumbar puncture, 70 c.c. slightly turbid fluid under marked pressure contained polymorphonuclears and lymphocytes in equal numbers and h. influenzæ direct and on culture. Twenty c.c. meningococcal serum was given intrathecally on the appearance of the fluid.

Course: Remittent temperature up to 100.4, with pulse up to 196; no vomiting; marked rigidity and head retraction. Death at thirteenth day of illness, after seven days in hospital.

CASE 3.

J. M., a male, aged 20 months, a country-dweller, was admitted on 29th August, 1936, on sixth day of illness. He had been in a local hospital for three days when he was lumbar punctured and diagnosed "probably cerebro-spinal fever" upon the turbid appearance of the fluid. He had a history of a fall two days before the gradual onset of headache, vomiting, and irritability, with rigidity developing. There was no previous history of illness apart from the fall.

On admission : Well nourished, bad colour, no rash; semi-conscious and irritable; moderate *tache;* well-marked rigidity and head retraction, no obvious paralysis. Tongue dry, coated; sordes in the mouth; throat clean and mild; heart, lungs, abdomen, and ears—nothing abnormal detected. Temperature 101.4, pulse 140. Lumbar puncture, 45 c.c. turbid fluid under pressure; cells all polymorphonuclears, no organisms direct, and sterile on culture.

Course : He was expectantly treated as a case of cerebro-spinal fever, and was given meningococcal serum intrathecally and intramuscularly on fifth, sixth, and seventh days, but on the seventh day organisms were seen in the cerebro-spinal fluid for the first time. These on culture proved to be h. influenzæ. Lumbar or cisternal drainage was repeated on ninth, sixteenth, nineteenth, and twenty-fifth days, with the recovery of h. influenzæ from each specimen of fluid—the amount drained off varied from 40 c.c. to 65 c.c. at a time. He ran a remittent temperature between 100 and 103, with pulse-rate between 140 and 160 throughout his stay in hospital. Consciousness returned after three days in hospital; he was easily fed and did not vomit until the terminal stages. Rigidity diminished early for three days without relation to treatment, but returned with marked retraction and warping persisting to the end. Emaciation was progressive and marked. For four days before death he had tremors in his hands and arms, and his sight became doubtful. He remained conscious but irritable until death at thirty-third day of illness.

CASE 4.

A. K., a female aged 25 months, a country-dweller, was admitted on 20th November, 1936, on the tenth day of illness. Onset was gradual; she was out of sorts and fretful; rigidity was noticed after about six days. There was no previous history of illness.

On admission : Well nourished, no rash, moderate *tache;* conscious but irritable; distinct rigidity of neck with little retraction, no obvious paralysis, but a suspicion of internal squint. Tongue moist, furred; clean, quiet fauces. Heart, lungs, abdomen, and ears—nothing abnormal detected. Temperature 100.4, pulse 132. Lumbar puncture, 30 c.c. turbid fluid, cells polymorphonuclears +, h. influenzæ direct and on culture. She was given 20 c.c. meningococcal serum intrathecally on the appearance of the fluid.

Course : She ran a remittent temperature up to 102.4, with a pulse between 120 and 140, throughout her stay in hospital. She was always conscious, but very fretful and irritable; she drank well and never vomited; the squint became marked, and

varied from day to day; emaciation was progressive, and with rigidity and retraction marked, the appearance became that of the chronic meningeal state. Lumbar or cisternal puncture was repeated on fourteenth, seventeenth, twentieth, twenty-fifth, and twenty-sixth days. H. influenzæ were recovered from the fluid until seventeenth day, thereafter the fluid was sterile. Death occurred on twenty-ninth day of illness.

CASE 5.

W. K., a male, aged 36 months, a country-dweller, was admitted on 1st October, 1937, on the third day of illness. Onset was sharp, with headache and stiffness of neck. He did not vomit. There was no previous history of illness.

On admission: Well nourished, good colour, no rash, doubtful *tache;* conscious, but dull and irritable; distinct rigidity of neck, with Kernig's and Brudzinski's signs present; no obvious paralysis; pupils equal, central, and active; knee-jerks sluggish. Tongue moist and coated; fauces clean and quiet; heart, lungs, abdomen, and ears—nothing abnormal detected. Temperature 101.4, pulse 96. Lumbar puncture, 35 c.c. turbid fluid containing polymorphonuclears + +, no organisms direct, and sterile on culture. He was given 20 c.c. meningococcal serum intrathecally on the appearance of the fluid. Lumbar drainage and 20 c.c. serum replacement was repeated next day, when the fluid contained less pus, no organisms, and was again sterile. This was followed by an apparent improvement in the general condition of the child, with a definitely falling temperature. Two days later, with the clinical improvement maintained, lumbar puncture gave 20 c.c. clear fluid containing scanty cells, no organisms, and sterile. On the tenth day of illness, with a return of rigidity and irritability, and temperature 102.4, lumbar puncture gave 30 c.c. turbid fluid containing polymorphonuclears +, no organisms, and sterile. Twenty c.c. meningococcal serum was given intrathecally, and 20 c.c. intramuscularly, this recrudescence being regarded as a relapse in the course of a cerebro-spinal fever. Next day lumbar puncture showed 30 c.c. almost clear fluid, scanty cells with lymphocytes = polymorphonuclears, no organisms, and sterile; 20 c.c. serum was given intramuscularly. On thirteenth day of illness he complained of a return of frontal headache, and was given 20 c.c. Soluseptasine intravenously and six Proseptasine tablets daily. The intravenous Soluseptasine was repeated on fourteenth and sixteenth days of illness. Lumbar puncture on fourteenth and sixteenth days each gave 30 c.c. of slightly turbid fluid containing more polymorphonuclears than lymphocytes, numerous h. influenzæ direct and pure on culture. On his seventeenth day of illness he was taken home to the country on the bad prognosis following upon the diagnosis of influenzal meningitis. Throughout his time in hospital he slept well, drank well, and never vomited, but became progressively more fretful, irritable, and emaciated. He never lost consciousness. His temperature was remittent up to 102.6, pulse-rate 84 to 120. He is now at the thirty-seventh day of his illness, and his doctor reports little change in his condition. He runs a temperature up to 100, and when last examined some days ago his cerebro-spinal fluid was still turbid.

CASE 6.

R. D., a female, aged 16 months, a town-dweller, was admitted on 25th October, 1937, on the fourth day of illness. There had been some days during which the child was definitely "off colour" before the definite onset of vomiting with diarrhœa, then convulsions and meningeal cry. There was no previous history of illness.

On admission: Moderately developed child, very poor colour, flaccid; semi-conscious and irritable upon handling; there was a faint mottling of her trunk, but no definite rash, and a moderate *tache;* her respirations were irregular, with frequent sighing; she had distinct rigidity of the neck with slight retraction; Kernig's and Brudzinski's signs were slight; pupils equal, inactive; knee-jerks brisk; no obvious paralysis. Tongue furred; clean, mild fauces; heart, lungs, abdomen, and ears—nothing abnormal detected. Temperature 102.2, pulse 136. Lumbar puncture, 10 c.c. turbid fluid with polymorphonuclears = lymphocytes; h. influenzæ present direct and on culture. She was given 20 c.c. soluseptasine intramuscularly, and the same quantity intravenously with glucose and calcium gluconate. This medication was repeated next day, and at first there appeared to be some improvement in the condition of the child: she was sleeping and drinking well and not vomiting. The temperature was remittent up to 102.8, pulse up to 200; she developed an internal squint with a purulent conjunctivitis; irregular respirations returned with convulsions, and she died within forty-eight hours of admission to hospital. She was in her sixth day of illness.

CASE 7.

R. R., a female, aged 9 months, a town-dweller, was admitted on 28th October, 1937, on the fifth day of illness. Onset was gradual: feverish and out of sorts, then vomiting and convulsions before admission. There was no previous history of illness.

On admission: Well nourished, colour fair, no rash, moderate *tache;* semi-conscious; slight rigidity of neck, no retraction, doubtful Kernig's sign; no obvious paralysis; pupils equal, reactions doubtful. Tongue furred, clean fauces; heart, lungs, abdomen, and ears—nothing abnormal detected. Temperature 101.2, pulse 160. Lumbar puncture, 45 c.c. turbid fluid containing more polymorphonuclears than lymphocytes, teeming with h. influenzæ direct and pure on culture. She was given 30 c.c. meningococcal serum intrathecally on the appearance of the fluid, and 10 c.c. prontosil intramuscularly. After a restless and convulsive night, with little fluid intake and no vomiting, she died within twenty-one hours of admission to hospital. She was in the sixth day of her illness.

ETIOLOGY.

Cases of influenzal meningitis were reported by Cohen in 1909, Ritchie in 1910, and Henry in 1912. In a recent article by Everley Jones he records the cases of influenzal meningitis diagnosed in St. Thomas's Hospital over a period of fifteen years. These totalled six, and this figure places h. influenzæ fourth as a cause of meningitis in children up to eight years of age. In Purdysburn the figures for the

same age group over the past eight years, i.e., since the first case was definitely diagnosed, show influenzal meningitis fourth also. The actual figures for the period are :—

Cerebro-spinal fever - - -	92 cases.
Tuberculous meningitis - -	28 cases.
Streptococcal meningitis - -	9 cases.
Influenzal meningitis - - -	7 cases.
Pneumococcal meningitis - -	6 cases.
Staphylococcal meningitis - -	1 case.

In the age group up to three years into which these seven cases fall, influenzal meningitis takes third place above streptococcal. Authorities state that the condition is almost limited to children under two years of age. Of these seven cases, two are over this limit; all fall between six and thirty-six months of age. Four of these cases were town-dwellers and three hailed from the country, and it may be more than coincidence that the three country patients were the oldest in the group at twenty, thirty, and thirty-six months respectively. Sex incidence is probably of little importance : five were females and two males.

Previous histories of the patients discovered nothing of importance; the story of the fall in case 3 seemed of no significance. In every case meningitis appeared to be the primary and sole condition present; in no case was there any history of ear symptoms.

Onset : In five cases the onset was gradual—one almost might be credited with a prodromal period; in only two patients the onset was sharp. Fretfulness and irritability were the predominant signs; the children were too young to report headache in every case, and it is noted only in the older patients. Vomiting was not the constant feature to be expected : actually three of the children never vomited throughout their illnesses. Convulsions were present at onset in only two cases. Squint was noticed at some stage of the illness in three patients. Conjunctivitis and rhinitis were each present in one case only. Gastro-intestinal disturbance was slight : one child had a history of diarrhœa and one was constipated. Nothing abnormal was found in the urine of the patients from whom it was obtained. There were no accompanying signs in the heart, lungs, and abdomen of any case.

Although the individuals were all well nourished, in only one was the colour good on admission, the general impression being that of a complete knockout of some origin. Rigidity was present in every case, but always of the "easily overcome" degree, probably an indication of the hopelessness of the struggle. In some cases Kernig's sign was of little assistance, and in these Brudzinski's neck-sign was of most value. There was no definite rash present in any case, and the *tache cérébrale* was of moderate degree only. Temperature and pulse were invariably disturbed, but showed no constant feature. The cerebro-spinal fluid was turbid on first examination in every case. The cellular reaction was mainly polymorphonuclear, with an appreciable lymphocytic content also.

The course of the illness varied markedly; two cases ended on the sixth day of disease and one still survives at the thirty-seventh day now. In the intermediate examples the outstanding and most tantalising feature is the tendency to periods of remission; in one case the fluid had become practically normal only to revert to its former turbidity later.

Treatment in our hands has been manifestly unsuccessful, but one essential feature must emerge from this report. That is the absolute necessity of giving meningococcal serum to every case of meningitis with a turbid fluid of unknown infection, on the chance of the case being one of cerebro-spinal fever, which is by far the commonest variety of meningitis in children. It appears to be quite impossible to differentiate clinically the several acute varieties, so that the diagnosis must depend entirely upon the bacteriologist. Nor is the infecting organism always to be recovered from the first sample of fluid; in one of these cases the h. influenzæ was not found until the fourteenth day of illness.

There is as yet no specific treatment to suggest. Some of the several preparations of the sulphonamide group of drugs have been used without any dramatic results to date.

The prognosis seems to be almost invariably fatal, although one of these seven cases still survives. In the series of six cases from St. Thomas's Hospital one patient made an uneventful recovery, and in this case, as in the survivor of the Purdysburn series, a sulphonamide preparation was used in the treatment.

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Senile Cataract

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THE word 'senile' in this connection is, I think, too strong. It implies something more than old age—almost decrepitude, in fact; whereas this type of cataract is found sometimes in people who are only 50. The word, however, has been so long in use that to alter it now, even if one wanted to do so, would be impossible.